optimized to make the function unscrambling easy. It is used for calibration purposes. That and the two higher frequency local oscillator signals **12-18**, **12-19** that are synthesized in the synthesizer go up by a multicoupler **12-20** and single cable to get up to the antenna (FIG. **9**). One clock signal **12-21**, which is called LOP, must be synchronously generated in order to do the IF sampling technique that is used to bring the data down. The power supply, of course, feeds not only the shelter-mounted equipment but sends power up to the antenna-mounted electronics as well.

The preferred antenna array, which is a six-sided or hexagonal array for a three-sector system which allows one to use two panels per sector, each one covering 60 degrees; the actual sweep for an array is plus or minus 45. It has good sector-to-antenna geometry, it avoids an end-fire-array problem.

While the invention has been described in relation to preferred embodiments of the invention, it will be appreciated that other embodiments, adaptations and modifications of the invention will be apparent to those skilled in the art.

What is claimed is:

1. In a cellular telephone communication system having at least one base station and a plurality of mobile stations in which both base and mobile station RF transceivers and a communication antenna array communicate using periodically repeated digital pulse sequence epochs whose time patterns are known at both transmitter and receiver, and each mobile station transceiver, during normal operation, establishes and maintains synchronization between the start of a received pulse epoch at the mobile station and the subsequent beginning of a responsive transmitted pulse epoch, the improvement wherein:

said base station includes a phase steered antenna array and a phased array beam former coupled thereto for digitally determining the azimuth direction to a responding mobile station,

said base station having a range measuring component to measure the time interval from the start of base station's transmitted pulse epoch to the start of the pulse epoch subsequently received from a selected mobile station and deriving range to said selected mobile station therefrom, said range and said azimuth direction constituting location data for said selected mobile station, and said cellular telephone system includes a unit for selectively commanding the acquisition of location data for a mobile station and means for selectively directing the resulting location data to one or more destinations.

2. The invention defined in claim **1** wherein said antenna array is a planar phase steered array.

3. The invention defined in claim **1** wherein said phase steered antenna array forms a plurality of beams and said base station includes a circuit for analyzing the plural beam signal outputs of said phase steered antenna array to estimate the direction of the mobile station from said base station.

4. The invention defined in claim **2** wherein said phase steered antenna array is coaxially oriented with respect to the communications antenna array.

5. The invention defined in claim **1** wherein said antenna array includes patch antennas.

6. The invention defined in claim **5** wherein said antenna array includes antenna elements comprised of at least a pair of said patch antennas which are vertically aligned.

7. The invention defined in claim **5** wherein said antenna array is comprised of a plurality of panels of said patch antennas.

8. The invention defined in claim **1** wherein said antenna array is comprised of a six-sided pattern of antennas.

9. The invention defined in claim **8** wherein each side of said six-sided antenna pattern is comprised of a series of patch antennas.

10. The invention defined in claim **7** wherein each of said patch antennas is comprised of a pair of vertically aligned patch antennas.

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